

REMARKS

Claims 1-17 and 19-22 are now pending in the application. Claims 1-4, 6-11, 13-15, 17 and 19-22 are rejected. Claims 5 and 12 are objected to, but contain allowable subject matter. Claim 16 is allowed. The amendments to the claims contained herein are intended to clarify the claimed invention. Applicant believes that these amendments place the application in condition for allowance and respectfully requests entry and consideration of the amendments after final rejection. Support for the amendments to Claims 1, 4, 5, and 17 are found in Applicant's specification at Paragraphs 2, 17, 29, 32, and 42, for example. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

REJECTION UNDER 35 U.S.C. § 102

Claims 1-4, 8 and 9 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Pat. No. 5,333,612 to Wild. This rejection is respectfully traversed. Claims 1-3, 6, 8 and 14 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Pat. No. 4,455,872 to Kossoff et al. This rejection is respectfully traversed.

Claim 1 has been amended to recite that a stage is disposed above and coupled to a proximal end of the support structure. Further, Claim 1 has also been amended to recite that the terminal end is in contact with a target comprising a weld. Neither Wild nor Kossoff discloses a transducer mounted on a stage that is disposed above the support structure, as is now required by Claim 1 and its dependent Claims 2-4, 8, and 9. Rather, Wild and Kossoff both disclose transducers and mounting gear for those transducers that are disposed inside of the support structure.

In particular, Wild discloses a transducer contained within an interior of a housing container, where the entire drive mechanism and transducer are contained inside and immersed within confined liquid. Wild: Col. 3 lines 6-7; Col. 3 lines 22-25; and Figure 2.

Likewise, Kossoff discloses an ultrasonic transducer disposed entirely within a storage housing (not near either end of the storage housing), where the transducer is immersed within a transmission fluid. Thus Kossoff does not disclose or suggest a transducer mounted on a stage that is disposed above a proximal end of a support structure.

A transducer that operates above and external to the support structure eliminates potential mechanical difficulties occurring when the transducer and the attendant drive mechanism are entirely submerged within the transmission media. Further, such an arrangement provides a simplified design. There is no disclosure, suggestion or motivation in either reference to provide a transducer mounted on a stage disposed above or external to the support structure.

Further, neither Wild nor Kossoff disclose an ultrasonic inspection assembly that contacts a target that comprises a weld. Both the Wild and Kossoff references provide devices for ultrasonic imaging of soft body tissues (*i.e.*, a human breast). As such, both Wild and Kossoff fail to anticipate the invention as claimed in independent Claim 1 and its dependent Claims 2-4, 6, 8, 9, and 14. In this regard, Applicant respectfully requests reconsideration and allowance of these claims.

REJECTION UNDER 35 U.S.C. § 103

Claims 10, 11, 13, 15, 17 and 19-22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Wild reference. This rejection is respectfully traversed.

Dependent Claims 10, 11, 13, and 15, which depend upon amended Claim 1, all recite a stage (on which the ultrasonic transducer is mounted) that is disposed above and coupled to a proximal end of the support structure. Further, Claim 1 now recites that the terminal end is in contact with a target comprising a weld. The Wild reference does not have any disclosure, suggestion, or motivation to provide a stage that supports a transducer that is disposed above (and external to) the support structure of the ultrasonic assembly. Rather, Wild discloses that the entire drive mechanism and ultrasonic transducer are contained within the housing and further elaborates that transducer supports (ring gears, skirts, and the like) are all contained within and affixed to interior portions of the housing container. *See e.g.*, Wild: Col. 3 line 46 - Col. 4 line 15. The “transducer element is entirely submersed within the confined liquid to insure proper ultrasound transmission to and from the tissue being interrogated” (Wild: Col. 3 lines 22-27). A transducer that operates above and external to the support structure eliminates potential mechanical difficulties occurring when the transducer and the attendant drive mechanism are entirely submerged within the transmission media.

Claim 17 and its dependent Claims 19-22 have been similarly amended to recite a method for non-destructive ultrasonic testing of a weld comprising positioning an ultrasonic detection assembly over a target comprising the weld. There is no suggestion or motivation in Wild to provide a method of non-destructive ultrasonic testing of a weld, as Wild pertains to ultrasound medical imaging of soft tissue. Claim

17 and its dependent Claims 19-22 also now recite a support structure that defines an interior space filled with a media that transmits ultrasonic waves. These claims further recite that a transducer is disposed above the support structure and is in contact with the media. As described above in the context of Claims 10, 11, 13, and 15, the Wild reference has no suggestion or motivation to provide a transducer disposed above the support structure. Thus, Applicant respectfully submits that Claims 10, 11, 13, 15, 17 and 19-22 are not rendered obvious over Wild and requests reconsideration of these claims.

Claims 6 and 14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Wild in view of Kossoff et al. This rejection is respectfully traversed.

Claims 6 and 14 are dependent upon amended Claim 1, as described above. For the reasons cited above, the Wild reference does not disclose, suggest or provide motivation to arrive at the invention as claimed in Claims 6 and 14. Kossoff does not account for the deficiencies of the Wild patent. For example, the Kossoff reference does not disclose or suggest a transducer mounted on a stage that is above a proximal end of a support structure, as in Claims 6 and 14. Rather, Kossoff discloses an ultrasonic transducer disposed and entirely immersed within a transmission fluid (*See, e.g., Kossoff: Figure 1 and Col. 3 lines 56-59*). As discussed above, a transducer that operates above and external to the support structure can provide various benefits for the operation and manufacture of the assembly.

Further, Claim 6 recites an interior space within the support structure that has a distance that optimizes an ultrasonic beam emitted from the transducer. Since both Wild and Kossoff disclose a transducer that can be maneuvered within the support

structure to ensure comprehensive imaging of the target (*See e.g.*, Wild: Col. 1 lines 35-41, Col. 3 lines 22-25 and Kossoff: Col. lines 4-7), there is no suggestion or motivation to specify a length of the support structure from a terminal end to a proximal end to optimize the ultrasonic beam being transmitted from a transducer mounted on a stage above the support structure, as is required by Claim 6. Neither Wild nor Kossoff suggest or motivate one of skill in the art to provide a transducer, mounted on a stage, which is disposed above the support structure.

Since both Wild and Kossoff specifically relate to ultrasonic imaging of soft tissues (body parts, *i.e.*, human breast), there is no disclosure, suggestion or motivation to modify the apparatus disclosed in Wild or Kossoff to arrive at the ultrasonic transducer inspection assembly that contacts a target having an industrial weld, as is recited in Claims 6 and 14 by virtue of their dependency on Claim 1. There is no motivation or suggestion to replace the device disclosed in Wild that is used for contact with a human body with a device that is designed to assess the integrity of a surface in an industrial application, where the target surface comprises a weld that is relatively small, flat, and potentially abrasive or sharp. Wild discloses a device that is pressed against a breast, with no suggestion or motivation to use the ultrasonic device for non-medical imaging, such as non-destructive weld testing. Similarly, Kossoff discloses a tank into which the target is immersed and then upwardly scanned. Kossoff: Figure 1, Col. 3 line 44 and lines 57-58. The device in Kossoff would not be capable of scanning welded portions of sheet metal or large industrial parts, as immersion and proper positioning of the target area of large metal parts are highly impractical.

Additionally, Claim 14 recites a high-frequency linear phased ultrasonic transducer array that is particularly suitable for use in assessing the structural integrity of a weld. There is no suggestion or motivation to substitute the medical imaging devices of Wild and Kossoff with a high-frequency linear phased array ultrasonic transducer to inspect a weld nugget. Thus, neither Kossoff nor Wild separately or in combination provide any suggestion or motivation to use medical imaging devices for soft tissue body parts in an industrial application that ascertains the integrity of weld joints on a metal target surface. As such, Applicant respectfully submits that neither Claim 6 nor 14 are rendered obvious in view of Wild over Kossoff and requests reconsideration thereof.

Claims 7 and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Kossoff reference. This rejection is respectfully traversed. Claims 7 and 15 are dependent upon amended Claim 1. Thus, for the reasons stated above, Kossoff does not disclose, nor does it suggest, a transducer mounted on a stage that is disposed above the support structure. Claim 7 recites that the stage disposed above and connected to the support structure are coupled to one another by a coupling comprising a seal to minimize leakage. Kossoff discloses an open tank into which the body part must be immersed for proper ultrasound scanning, as discussed above. There is no suggestion or motivation in Kossoff to provide a seal in a coupling between an overhead stage and the support structure to prevent leakage, because there the tank must remain open and an overhead stage would render it inoperable. Likewise, Claim 15 recites a support structure having a length of less than about 25 mm. There is no disclosure or suggestion in Kossoff to have a transducer mounted over a proximal end

of the support structure, where the support structure has a length of less than 25 mm. As such, Kossoff does not disclose, suggest, or provide any motivation to arrive at the invention recited in either Claims 7 or 15.

For the reasons set forth above, Applicant respectfully requests reconsideration of the claims and respectfully submits that Claims 10, 11, 13, 15, 17, and 19-22 are in condition for allowance.

ALLOWABLE SUBJECT MATTER

The Examiner previously indicated that Claim 16 is allowed and that Claim 5 would be allowable over the cited art of record if rewritten in independent form. The Examiner has now indicated that Claim 12 likewise would be allowable over the cited art of record if rewritten in independent form. Applicant thanks the Examiner for the thorough consideration of the claims and allowance of the indicated claims.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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HARNES, DICKY & PIERCE, P.L.C.
P.O. Box 828
Bloomfield Hills, Michigan 48303
(248) 641-1600

By: Jennifer M. Woodside Wojtala
Anna M. Budde
Reg. No. 35,085

Jennifer M. Woodside Wojtala
Reg. No. 50,721

CORRESPONDENCE ADDRESS:
Kathryn A. Marra
General Motors Corporation
Legal Staff - Mail Code 482-C23-B21
PO Box 300 - 300 Renaissance Center
Detroit, Michigan 48265-3000
Ph: 313-665-4708
Fax: 313-665-4976

JMW/sem